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DURING

INSTRUMENTAL DELIVERY

WITH AN ILLUSTRATIVE CASE.

BY

W. H. STUDLEY, M.D.,

NEW YORK.



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## Fracture of the Pelvis during Instrumental Delivery, with an Illustrative Case.

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WORKS on surgery and obstetrics are more or less replete with the details of deformities of the pelvic bones and their consequences in regard to their causal relationship with dystocia; but, as bearing on the subject under consideration, it is only necessary to refer to those connected with pelvic fractures and morbus coxarius. The causes of dystocia in consequence of fractures are mainly due to displaced bones and the formation of callus. Spiegelberg, in his *Obstetrics*, Vol. II., page 498, says: "Fractures of the pelvic bones, although generally fatal on account of the simultaneous injuries of important organs, may heal with so much deformity and with so strong a callus that the remaining displacement of the bones, as well as the projecting callus, considerably narrows the pelvis. A number of these rare cases have been collected by Lenoir. (*Difformités du bassin par cals difformes, etc. Arch. Gén. de Méd.*, Jan., 1859). Naegele-Grenser has other cases. In Barlow's case the os pubis was fractured and the callus so voluminous as to reach to 1.5 cm. of the promontory. Laparotomy after rupture of the uterus saved the patient. In the Musée Dupuytren there is a pelvis without history, the acetabulum of which is shattered and so united that the callus projects 4 cm. into the pelvic cavity. The anterior portion of the pubic bones is dislocated inwards."

Tyler Smith, in his *Lectures on Obstetrics*, page 499, says: "The rarity of fractures of the pelvis in women is compensated for, if the expression may be allowed, by the fact that they are generally attended with permanent displacement or other

results which tend to diminish the capacity of the pelvis. The deposit of callus which takes place would appear to be very erratic, and to have a tendency to encroach upon the cavity of the pelvis. Dr. Lever met with a case where there was a bony projection of more than an inch into the pelvic cavity, in consequence of a fracture of the acetabulum; and Burns relates a case where a similar ossific formation resulted from a similar injury, the projection being two inches long."

Hamilton on Fractures, page 344, gives an account of a man who fell some thirty feet and fractured the acetabulum; he recovered in eight weeks and was able to walk almost as well as ever. He subsequently died of disease of the chest, and dissection revealed a fracture running in two directions through the acetabulum, an extensive comminuted fracture of the ilium, and three fractures of the os pubis; the repair was complete, with little or no deposit of bone in the acetabulum, but an abundant deposit of callus around the other parts of the fractured bone. I only mention the case as illustrating the great tendency to the formation of callus in pelvic fractures, and the way it conduces to dystocia when occurring in the female.

It is quite important to decide what the peculiar features in pelvic fractures are, which in some instances tend to a fatal issue, and in others to a favorable one.

Erichsen, page 221, says: "In fractures of the pelvis the danger depends not so much on the extent of the fracture as on its complication with internal injury, and the violence with which it has been inflicted." "In fractured pelvis, the principal sources of danger arise from injury to the bladder and urethra, with consequent extravasation of urine; from laceration of the rectum or fracture of the acetabulum."

Hamilton, speaking of fractures of the pubis (l. c., page 338), says: "The danger in these accidents consists not so much in the fracture as in the injury done to the bladder and other pelvic viscera. If the bladder is opened into the peritoneal cavity, death is almost inevitable, and even when the urethra and bladder have suffered laceration lower down, or at any point above the deep perineal fascia, extensive urinary infiltrations, followed by abscesses and gangrene, generally expose these patients to the most imminent hazards."

These statements are fully verified by cases cited from Sir



Astley Cooper, Lente, Hall, Malgaigne, Clark, Marat, Cappelletti, Whittaker, and others. In the same author's account of the fractures of the ischium, ilium, sacrum, and acetabulum—and the cases mentioned as illustrative—the dangers to the patient are shown to be proportionable mainly to the wounding of the urinary organs, the rectum, the peritoneum, or the other soft parts; and, per contra, the immunity from an unfavorable result is shown to be due to exemption from the wounding of such viscera.

The literature of pelvic fractures would indicate that, in almost every instance, their causes are external direct violence. In regard to such accidents arising from internal violence, I have been able to find but few accounts, and those are exceedingly meagre.

Bedford (*Principles and Practice of Obstetrics*), speaking of the danger of forceps delivery, limits himself to this statement, "Instances are recorded in which, especially where there was slight contraction, the bones of the pelvis have been fractured by the amount of force employed."

Hamilton, in his paragraph on fractures of the ischium, confines himself to this simple sentence: "Perhaps the most remarkable instance is that mentioned by Marat, as having occurred in a female during labor." Inasmuch as Marat is inaccessible, I am unable to give the history of that remarkable instance. I infer that the accident alluded to by these authors was limited to what might very naturally occur as a consequence of too much leverage action of the forceps, viz., a fracture of the pubic or ischiatic rami. I am unable to learn of an instance in which the bony pelvic ring has been completely severed by fracture as a consequence of dystocia, whether left to nature or complicated with manual or instrumental interference. It is exceedingly doubtful whether the *healthy* bony pelvis can be completely parted by fracture, under even a somewhat violent and reckless management of instrumental delivery, while it is quite conceivable and quite probable that such an occurrence might ensue, even under a judicious use of the forceps, where the bones have been weakened by disease.

Let us now inquire into the relationship which hip-disease holds with deformities of the pelvis, and hence as such with

dystocia; and also as regards its effects upon the bony structure. Erichsen divides hip-disease into the arthritic, the acetabular, and the femoral varieties, according as the soft structure of the joint, the acetabulum, or the head of the femur is principally or primarily affected. The acetabular form of the disease is the most fatal, and tends sooner or later to death, in consequence of the ravages which it makes in the intra-pelvic space in the form of abscesses. The arthritic form is perhaps the most painful and acute in its nature, but is disposed to complicate the femoral variety, and practically, so far as remote effects are concerned, it may be identified with that form of the disease. The femoral variety is of special interest in that it is that form of the disease which far oftener than the others conduces to change of the pelvic bones. It is this form which especially disposes to dislocations, because of the destruction of the head of the femur, and the filling of the acetabulum with fibro-plastic deposit. If it remain within the socket, the leg is frequently shortened, in consequence of the absorption of the head of the femur. In both cases the leg becomes shortened as a natural consequence—an important element, as we shall see in the modification of the natural form of the pelvis. The shortening of the limb is also contributed to by its general atrophy consequent upon disease.

How does this state of things affect the normal pelvic conformation? In the incipient stage of morbus coxarius of whatever variety, the leg is instinctively lifted from the ground to guard against the infliction of pain. In this act the pelvis is tilted into the oblique position, wherein the affected side is highest; this, of course, throws the antagonism between the weight of the body on the one hand, and the supporting sound leg on the other, into a line forming an angle with the pelvic axis, proportionable to its obliquity. If the disease begins in early life, and, in consequence of the destructive processes above mentioned, continues up to or beyond puberty, necessitating almost the exclusive use of the sound leg, and the disuse of the diseased one, such a condition is calculated to result in flattening or depression of the pelvis on the sound side, and a corresponding or compensating curvature taking an oblique direction on the other.

Spiegelberg (l. c., page 476) says: "Should one leg in



consequence of coxitis be unfit for use, the other or normal side will have to bear an abnormal pressure, and the oblique contraction will be found on the side not affected by a pathological process."

Cazeaux (Midwifery, page 556) says: "Persons affected with chronic disease of one of these limbs, and therefore under the necessity of walking with crutches and of bearing the whole weight of the body on the sound side, incur the same danger" (referring to a depression of the pelvic bones).

But, as already implied, this result is conditional; the disease must begin while the bones are yet in a process of development, and its ravages must entail long-continued disuse of the affected side. On the other hand, if it run a comparatively short career, and the patient is able to resume the use of the limb in locomotion, the result is quite contrary.

Spiegelberg (l. c., page 476) says: "If the shortened leg should be used, the oblique contraction will be found on the *primarily affected side*, because in this case the upper part of the body bends over to this side in standing and will be thrown upon it in walking with a certain amount of power."

Cazeaux (l. c., page 556) says: "It is further possible that a shortening of one of the legs, whether resulting from a fracture, a luxation, or an atrophy of the limb, may produce the same result (meaning a thrusting in of the pelvis on the affected side), more especially if these accidents take place in early childhood, when the pelvis is still far from having acquired its full development."

But such a termination is not altogether due to the peculiar use to which the limb on the affected side is put in standing and walking.

Spiegelberg (l. c., page 476) says: "This side, besides showing the effects of the primary disease, will be contracted and too small, if not obliquely distorted, being impeded in its development by the inflammatory sclerotic process. We find the os innominatum kept back in its growth in every direction, the ramus longitudinalis, crista pubis and tuber ischii atrophied, etc."

Tyler Smith<sup>1</sup> says: "At the time of puberty, we have the three permanent articulations of the true pelvis, viz., the

<sup>1</sup> L. c., pp. 559 and 600.

two sacro-iliac synchondroses, and the symphysis pubis. We have also the Y-shaped triple articulations between the ilium, ischium, and pubis on each side. These make in all nine articulations and seven separate bones for the true pelvis. These bones all grow from the centre to the circumference, and it is to this circumferential increase, taken collectively, that the expansion of the pelvis at puberty is attributable. It is not a little remarkable that the divisions between the ilium, ischium, and pubis should remain until after the completion of the development of puberty. The capacity of the pelvis must very much depend on the period at which the junction of these bones takes place. When ankylosis takes place between the sacrum and ilium before the period of puberty, the circumferential increase of the aspects of the sacrum and ilium engaged in the articulation is impossible. Hence the arrest of growth on the ankylosed side of the pelvis upon which the oblique deformity depends." "It is probable that, when this consolidation and the obliteration of the Y-shaped articulations take place early, we have in some cases the infantile or equally contracted pelvis."

Although the above paragraph contains no direct allusion to the effects of morbus coxarius on the bony pelvis, yet it is impossible not to draw the inference therefrom that any pathological condition of the hip-joint, involving its integrity to the extent that the latter disease usually does, especially in early life, is very naturally calculated to arrest development, and, in combination with other forces, to produce deformity.

With these brief considerations of the subjects of pelvic fracture and morbus coxarius in the female, in some respects directly and in others indirectly bearing upon the nature of a case in my practice, I will now present it in detail. It is one of fracture of the pelvis, occurring during instrumental delivery in a subject affected with hip-disease beginning in early life.

Mrs. P. at the present time is between 30 and 31 years of age. Her usual weight for the last ten or twelve years has been in the neighborhood of 150 pounds. When about eight years of age, up to which time she was a very healthy child, she received an injury of the right hip by a fall. Shortly afterwards she experienced pain in the knee, and ultimately had to take to her bed. The case was pronounced hip-disease, and treated as such by issues and rest. Under this treatment she partially recovered, and for some nine

years, although able to get around on a shortened and limping leg, she suffered much, and was but indifferently well. At this time an abscess formed for the first time a little below the trochanter major. It was opened, discharged for some months, when she went under Dr. Davis' treatment, with his extending and counter-extending splint. Under his treatment she greatly improved, and finally was able to throw aside her appliances. Some three years after the first abscess, another formed, and I opened it. The discharge soon ceased. Some two years afterwards she married. For some five years afterwards, the husband was unable to accomplish perfectly the sexual act, in consequence of the great adduction of the right thigh towards the median line. He consulted me in reference to the matter, and wished me to make an examination of his wife, to learn whether anything was wrong with her genital organs. With her ready consent I did so, and found them in normal condition and well developed. But, in consequence of an almost ankylosed condition of the hip, and the great adduction of the thigh, I could perfectly understand the obstacle which the husband had to encounter when attempting copulation in the usual way. Somewhat jocosely, I suggested that he attempt the act canine fashion. Without a thought further in regard to the matter, and when the subject had passed entirely out of mind, two months afterwards he called at my office to inform me that my suggestion had resulted in a perfect success, and that his wife was encephalic. I now began to feel an unpleasant responsibility for the consequences of my thoughtless and hasty hint. Although given without any reference or view to progeny, I felt none the less that I had neglected a physician's duty in not speaking of the possible and probable unhappy results which might follow.

As gestation proceeded I had a curiosity to learn the exact condition of the bony pelvis, and hence sought and obtained digital and inspectional examinations on several occasions. These revealed the fact that the ramus of the pubis on the diseased side was more perpendicular than its opposite fellow, and that its body appreciably encroached upon the normal pelvic cavity. I could make out no antero-posterior shortening. The health of the patient was excellent from first to last of gestation. My hopes, based mainly on this fact, were that all might turn out well. Nevertheless I prepared for trouble. The line of action marked out by me was to let her go on to full term, and when labor should begin, to put her under the influence of chloroform and make a thorough manual examination of the pelvic capacity. If I should find little or no appreciable deformity, Nature would of course be permitted to do her perfect work aided perhaps, if necessary, by the forceps. If I found deformity to such an extent as to admit of no probability of bringing a living child through the natural channel, I then would fall back upon one of two sources, viz., embryotomy or laparoclytotomy, ruling out the Cesarean operation under the conviction that Thomas had laid it upon the shelf. To meet these several possibilities I engaged Dr. J. R. MacGregor to be with me when



our services should be needed. I also, in view of the possibility of the operation of laparo-elytrotomy, called upon Dr. T. G. Thomas to obtain his services in case it should be decided to perform it, and that gentleman generously consented to be with me if he were needed, at any hour of the day or night. In doubt as to the limit of the claims of embryotomy on the one hand and Thomas' operation on the other, I wrote to Dr. Thomas for information on this point. Of course, it was clear that an extreme deformity of pelvis should decide in favor of laparo-elytrotomy. But the question occurred to me, Suppose I find a pelvic condition which, while it might possibly admit of delivery by means of embryotomy, yet would so far subject the patient to dangers as to call for apprehension and anxiety, would laparo-elytrotomy in such a case be justifiable? In consequence of Dr. Thomas' absence from the city I received no answer to my communication and so was left to my own resources.

On the 4th of June, at 10 A.M., at the full term of gestation, I was called to my patient to find her in labor. I immediately summoned Dr. MacGregor, who kindly gave up important business and responded to my call. He administered the chloroform and I proceeded to make a manual exploration. I succeeded in passing with difficulty my hand, closed fist-form, between the pubis and the promontory of the sacrum, pushing up the gravid uterus as I did so. The transverse pelvic diameter seemed not of the normal length, and I found that the pelvic brim on the right side (the diseased side) was straighter than it ought to be. The pubic ramus on the corresponding side was less arched than its fellow. Dr. MacGregor made a digital examination, and so far as he could judge, thought the pelvis to be as I had found it. Our conclusion was that it was a case which, as a first procedure at least, ought to be relegated to the trial of the forceps. But inasmuch as dilatation was not sufficient for such an undertaking at present, we left to meet at 1 P.M. At this hour, we found that pains had continued and dilatation had made progress. Determined to let Nature take her course as far as admissible, we decided to wait until 5 P.M. At this hour, we found the patient somewhat exhausted; os dilated to two or two and a half inches, and dilatable. We concluded to rupture the membranes and apply the forceps. Dr. MacGregor chloroformed the patient and I proceeded to apply the instruments. They were adjusted without difficulty. In consequence of the peculiar angle which the pelvis makes with the spinal column in cases of long-standing hip-disease, the patient had to be moved so far towards the edge of the bed as to permit the buttocks to project over its edge, in order to allow the handles of the forceps to conform to the line of the axis of the brim of the pelvis. With the feet and legs held by two strong female assistants and with myself upon my knees on the floor, tractions were made downwards, and, as far as could be judged, in the line of the pelvic axis, at short intervals, until I became exhausted. I thought that I had brought the head down to the extent of an inch of the cranial segment below the superior

strait. Dr. MacGregor and I now exchanged places. He continued his efforts until exhausted, but felt that they were crowned with the success of a decided descent of the head. When again we exchanged places I certainly could confirm his opinion. I again set to work and continued for at least twenty or thirty minutes, but after becoming completely tired out in my efforts, and perceiving that I had made little or no progress, I expressed the opinion that we would have to resort to craniotomy. He thought that he would like to make one more effort with the forceps. Shortly afterwards, when he was making powerful tractions, I heard two distinct smothered snaps. I remarked, "Doctor, have your forceps slipped?" He answered, "Something has given way;" and being exhausted, called me again to the work, remarking that he thought the head had made a decided descent. As I proceeded to examine the situation of things, my hand came in contact with a sharp projecting bone. I at first thought that it was a fractured cranial bone, but upon closer examination found it to be the pubic ramus of the right side. Passing my finger into the vagina, I found the head quite low in the pelvis, and exploring in the region of the pubis, I found that its body could be moved forward. The pubic synchondrosis seemed undisturbed. Under the circumstances we concluded that delivery could and should be accomplished. Dr. MacGregor took the forceps and very easily brought into the world a large, at least ten-pound child. With great difficulty, and after long and continued efforts at establishing respiration, we succeeded in part in resuscitating the child. But after a few hours it died. The after-birth came away readily, and under the influence of ice and ergot which we freely administered, as the hemorrhage was considerable, the womb at last firmly contracted.

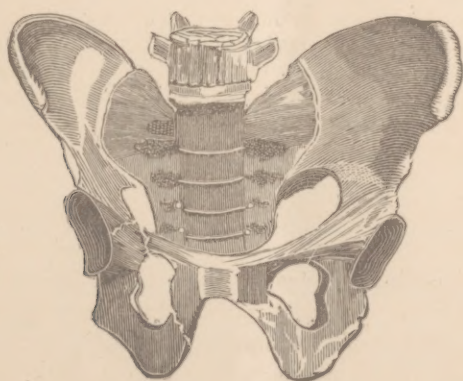
On subsequent careful examination I found the following conditions: The pubic ramus was fractured obliquely, beginning about where the ascending ramus of the ischium meets it, and pursuing an upward and outward course into the obturator foramen. The soft parts were lacerated by the protruding pubic ramus up to the arch of the pubis. The pubic body was fractured about two inches from the symphysis pubis or in the neighborhood of an inch from the edge of the acetabulum. Exactly what course this fracture took could not be made out by most persistent and varied manipulation. But the symptoms immediately following and continuing to the present time indicate that it, and perhaps other fractures, led into the acetabulum. Tenderness and pain in the region of the sacro-iliac synchondrosis, which followed and which continue to the present time, would indicate that either a separation or a fracture took place in that region. At no time were there any signs or symptoms to show that the pubic symphysis was even put upon the strain. From first to last all pain and trouble in movement were referred to the region of the hip. Of course, the worst possible prognosis was held out to and pressed upon the notice of the friends. But under the use of stimulants, anodynes, sustaining nourishment, frequent douchings of the vagina with carbolized water, in short,

the best of nursing care in general, the patient rallied beyond all expectations. She confessed to little or no pain except when moved, and then she described it as excruciating, and always referred it to the locality of the acetabulum. She had no metritis, no peritonitis. On the fifth and sixth day she had chills, fever, headache, sweats, and diarrhea, evincing thereby septicemic poisoning. The first four days she was unable to pass urine without the aid of the catheter. The fracture was treated by a girdle of strong linen webbing, well padded and buckled around the hips. Several small pieces of the fractured ramus have come away, and at last examination, now some seven months from the time of the accident, the laceration was so closed that I could barely touch the bone. The fracture of the body of the pubis was not attended with laceration and is now firmly united; no appreciable callus is discoverable. The patient at present walks on crutches, is unable as yet to take more than one or two steps without them, always experiencing pain in the hips when resting her weight on the leg, and often having severe neuralgic pains from the hip to the knee. Her general health is excellent, her spirits buoyant and hopeful, and she declares that it is her full intention, when she gets a little better, to take measures for another child, with the express understanding that it shall be brought into the world by means of "Thomas' operation." Being not an unintelligent woman, I had taken particular pains to make her understand the true nature of her case, the troubles and difficulties which might arise therefrom, and the measures that might have to be resorted to in order to meet them. Being a strict Catholic, she had a strong prejudice against pitting her life against that of her infant, and she was inclined to decide that, if one must be sacrificed, that one must be herself; and I had no small trouble in clearing my skirts of blame for resorting to a course that resulted in the child's death, instead of adopting one that almost certainly promised the child's safety and bid fair chances for that of the mother.

As regards the causes of the accident, there is no doubt that there were two at least, one a predisposing and the other an exciting cause; the one dependent upon diseased and deformed bones from morbus coxarius, the other upon the tractions or manipulations of the forceps. As to just the extent or the exact nature of the disease and impairment of the bones, it is impossible to determine. But from all the evidences in the case I am forced to the conviction that the ilium, ischium, and pubis were all involved in the pathological conditions, the central point of which was the acetabulum. It was a case which I think can be entirely referable to simple traumatism, occurring in a young but healthy subject, which, by means of subsequent diseased action on the as yet undeveloped, but



growing bones, caused defective nutrition, lack of natural evolution, modification of normal conformation, and impairment of structural firmness. The proximal cause of the accident was, as above stated, the action of the forceps. Were they properly or improperly used? From actual observation and from a knowledge of my colleague's well-known skill, I am constrained to say that in no respect were the forceps improperly handled, either as regards the force employed, the axial direction followed, or the amount of leverage exhibited. My view of the immediate cause and nature of the occurrence is simply this. As the head descended under the tractions of the forceps with its resisting contour, covered by one of the blades impinging directly against the acetabular region of the straightened side of the brim, the pelvis parted *there* under the force imposed, and immediately afterwards, as the whole strain now fell upon the slender ramus, *that* of necessity gave way and severance of the pelvic continuity was accomplished. The cut below, made under my directions, represents the pelvic conformation and the locality of the fractures as I conceived them to be.



In a surgical as well as obstetrical point of view, it is an interesting question to decide as to the essential elements entering into our patient's recovery. Throwing aside the treatment and good nursing care which she received as simple adjuvants to this end, I think that it depended mainly upon the fact that none of the pelvic viscera received serious injury.







